Non-prompt μ Spectrum

Data from Half-density Target Runs

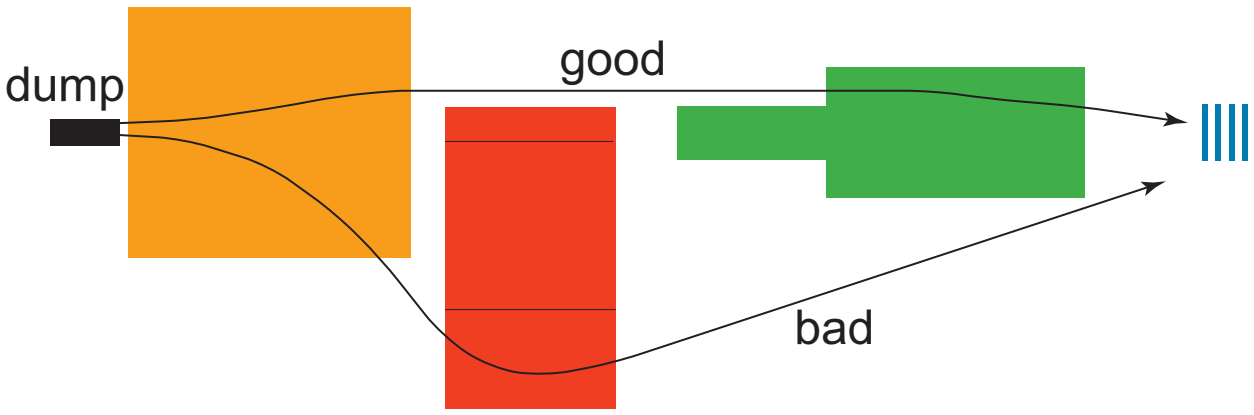
Purpose: To extract information about the neutrino spectrum using muon flux from the dump

Method: Use T1•T3 triggers and compare pot-normalized flux of half-density data to full-density data

Use only those muons in or near the "eyes"

Require Mu ID > 3 hits

Define "good" and "bad" muons:



By restricting the angle of the muons at the emulsion, the muons must be emerging from the steel

$\Rightarrow \mu$ pass thru many meters of steel, or

$\Rightarrow \mu$ originates in the steel (trident production)

Either way, the process requires a high-energy muon.

This fact makes the **link** between muon production and neutrino production

The muons in the T1•T3 trigger at large (>100 mrad) angles are from indirect paths thru the shield and so are **not** necessarily correlated to neutrinos

Assuming the small angle tracks are correlated to the neutrino flux that will produce interactions :

$$\text{fraction non-prompt } \nu = 1 - \frac{\text{half-density } \mu \text{ flux}}{\text{full-density } \mu \text{ flux}}$$